

81. (New) The system according to claim 80, wherein the reactor comprises a steam reformer that includes a burner having an inlet for receiving heavy product from the rotary pressure swing adsorption module for burning within the burner.
82. (New) The system according to claim 78, wherein the rotary pressure swing adsorption module includes an adsorbent that preferentially adsorbs at least one carbon oxide.
83. (New) The system according to claim 82, wherein the carbon oxide is carbon monoxide or carbon dioxide.
84. (New) The system according to claim 32, wherein the first rotary pressure swing adsorption system includes an adsorbent that preferentially adsorbs at least one carbon oxide.
85. (New) The system according to claim 84, wherein the carbon oxide is carbon monoxide or carbon dioxide.
86. (New) An electrical current generating system, comprising:
at least one fuel cell defining an anode inlet and an anode outlet; and
a hydrogen gas separation device coupled to the fuel cell anode inlet for delivering enriched hydrogen to the fuel cell anode, the hydrogen gas separation device receiving a recycle gas from the fuel cell anode outlet and a hydrogen feed gas from a hydrogen gas generating system.
87. (New) The system according to claim 86, wherein the hydrogen gas generating system comprises a reformer reactor or a partial oxidation reactor.
88. (New) The system according to claim 86, wherein the hydrogen gas separation device comprises an adsorption device.
89. (New) The system according to claim 88, wherein the adsorption device comprises a rotary pressure swing adsorption module.

90. (New) The system according to claim 86, wherein the hydrogen gas separation device comprises a first inlet for receiving the recycle gas from the fuel cell anode outlet and a second inlet for receiving the hydrogen feed gas from a hydrogen gas generating system.

91. (New) The system according to claim 88, wherein the electrical current generating system further comprises a system for recirculating a heavy product exhaust gas through the adsorption device.

92. (New) The system according to claim 86, wherein the hydrogen gas separation device preferentially separates at least one carbon oxide from the recycle gas and the hydrogen feed gas.

93. (New) The system according to claim 92, wherein the carbon oxide is carbon monoxide or carbon dioxide.

94. (New) An electrical current generating system, comprising:
at least one fuel cell defining an anode inlet, an anode outlet, and a cathode inlet;
an oxygen gas delivery system coupled to the cathode inlet for delivering oxygen gas to the fuel cell cathode; and
a hydrogen gas separation device coupled to the fuel cell anode inlet for delivering enriched hydrogen to the fuel cell anode, wherein the hydrogen gas separation device receives a recycle gas from the fuel cell anode outlet and a hydrogen feed gas from a hydrogen gas generating system.

95. (New) The system according to claim 94, wherein the hydrogen gas generating system comprises a reformer reactor or a partial oxidation reactor.

96. (New) The system according to claim 94, wherein the hydrogen gas separation device comprises an adsorption device.

97. (New) The system according to claim 96, wherein the adsorption device comprises a rotary pressure swing adsorption module.

98. (New) The system according to claim 94, wherein the hydrogen gas separation device comprises a first inlet for receiving the recycle gas from the fuel cell anode outlet and a second inlet for receiving the hydrogen feed gas from a hydrogen gas generating system.

99. (New) The system according to claim 96, wherein the electrical current generating system further comprises a system for recirculating a heavy product exhaust gas through the adsorption device.

100. (New) The system according to claim 94, wherein the hydrogen gas separation device preferentially separates at least one carbon oxide from the recycle gas and the hydrogen feed gas.

101. (New) The system according to claim 100, wherein the carbon oxide is carbon monoxide or carbon dioxide.

102. (New) A process for providing hydrogen gas to a fuel cell, comprising:
providing a rotary pressure swing adsorption module that can produce a purified hydrogen-containing gas; and
introducing the purified hydrogen-containing gas into a fuel cell.

103. (New) The process according to claim 101, further comprising introducing a hydrogen-containing feed gas into the rotary pressure swing adsorption module, wherein the hydrogen-containing feed gas is generated by reforming or partial oxidation.

104. (New) The process according to claim 103, wherein the hydrogen-containing feed gas includes at least one carbon oxide and the rotary pressure swing adsorption module removes a substantial amount of the carbon oxide.

105. (New) The process according to claim 104, wherein the carbon oxide is selected from carbon monoxide and carbon dioxide.

106. (New) The process according to claim 103, further comprising heating the reforming or partial oxidation reaction by utilizing the combustion energy of a heavy product exhaust gas produced by the rotary pressure swing adsorption module

107. (New) A process for providing hydrogen gas to a fuel cell, comprising:
providing a hydrogen gas separation module for delivering purified hydrogen-containing gas stream to a fuel cell;
introducing a fuel cell effluent into the hydrogen gas separation module as a first hydrogen-containing gas feed stream; and
introducing a second hydrogen-containing gas feed stream into the hydrogen gas separation module.

108. (New) A process for providing hydrogen gas and oxygen gas to a fuel cell, comprising:
introducing an oxygen gas stream to a fuel cell cathode;
providing a hydrogen gas separation module for delivering purified hydrogen gas stream to a fuel cell anode;
introducing a fuel cell effluent into the hydrogen gas separation module as a first hydrogen gas feed stream; and
introducing a second hydrogen gas feed stream into the hydrogen gas separation module.

109. (New) The process according to claim 108, wherein the hydrogen gas separation module comprises a pressure swing adsorption module.

110. (New) The process according to claim 108, wherein the hydrogen gas separation module removes at least a portion of at least one carbon oxide component from at least one of the first hydrogen gas feed stream or the second hydrogen gas feed stream.

111. (New) The process according to claim 110, comprising removing a substantial amount of carbon dioxide present in the first hydrogen-containing gas feed stream.

112. (New) The process according to claim 110, wherein the carbon oxide is carbon monoxide or carbon dioxide.

113. (New) A process for providing hydrogen gas to a fuel cell, comprising:
adsorbing at least one contaminant from a first hydrogen-containing feed gas stream to produce a first purified hydrogen-containing gas stream;
adsorbing at least one contaminant from a second hydrogen-containing feed gas stream to produce a second purified hydrogen-containing gas stream; and
introducing the first purified hydrogen-containing gas stream and the second purified hydrogen-containing gas stream into the fuel cell.

114. (New) A process for providing hydrogen gas and oxygen gas to a fuel cell, comprising:
introducing an oxygen gas stream into a fuel cell cathode;
adsorbing at least one contaminant from a first hydrogen feed gas stream to produce a first purified hydrogen gas stream;
adsorbing at least one contaminant from a second hydrogen feed gas stream to produce a second purified hydrogen gas stream; and
introducing the first purified hydrogen gas stream and the second purified hydrogen gas stream into a fuel cell anode.

115. (New) The process according to claim 114, further comprising reforming or partially oxidizing a hydrocarbon fuel to produce the first hydrogen feed gas stream.

116. (New) The process according to claim 115, further comprising recycling an exhaust stream from the fuel cell anode to produce the second hydrogen feed gas stream.

117. (New) An electrical current generating system, comprising:
at least one fuel cell;
a hydrogen gas delivery system coupled to the fuel cell, the hydrogen gas delivery system including a hydrogen gas generating reactor; and
an oxygen gas delivery system coupled to the fuel cell, the oxygen gas delivery system including at least one air compressor for delivering a first air stream to the oxygen gas delivery system and a second air stream to the hydrogen gas delivery system.

118. (New) An electrical current generating system, comprising:
at least one fuel cell;
a hydrogen gas delivery system coupled to the fuel cell;
an oxygen gas delivery system coupled to the fuel cell; and
a gas turbine system coupled to at least one of the hydrogen gas delivery system or oxygen gas delivery system.

119. (New) The system according to claim 118, wherein the hydrogen gas delivery system includes a combustion device exhausting a combustion gas, and the gas turbine system is coupled to the combustion device for receiving the combustion gas as a working fluid for driving the hydrogen gas delivery system or the oxygen gas delivery system.

120. (New) The system according to claim 119, wherein the combustion device comprises at least one burner defining an outlet for the combustion gas, and the gas turbine system comprises at least one expander having an inlet fluidly communicating with the burner outlet for receiving the combustion gas and at least one compressor or vacuum pump coupled to the expander.

121. (New) The system according to claim 119, wherein the hydrogen gas delivery system includes a pressure swing adsorption module that can produce a heavy product exhaust gas stream for delivery to the combustion device.

REMARKS

Entry of claims 78- 121 is respectfully requested. Support for claims 78-121 is found in the specification as follows:

Claims 78 and 102 – Page 6, lines 14-19 and page 20, lines 16-17.

Claim 79 – Page 6, lines 18-22.

Claim 80 - Page 6, lines 14-18.

Claim 81 – Page 6, lines 27-31.

Claims 82-85, 92-93, 100-101, 104-105, and 110-112 – Page 8, lines 22-27, and page 44, line 30 – page 45, line 15.

Claims 86, 88-90, 94, 96-98, 107-109, 113-114, and 116 – Page 6, lines 10-19; and elements 10, 436, and 438 of Figure 12.